"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Letters to the Editor 62-58-3-29/30

Electron Paramagnetic Resonance in the System $R_3Al-TiCl_4$

from the usual free-radical one. It is, apart from other properties, of a heterogenous character. It could be assumed that the primary formation of the radicals would have on effect on the nature of the (forming) heterogenous catalyst. The authors of this letter found an electron paramagnetic resonance with a g-factor around 2. In the system $Al(i\text{-}C_4H_9)_3\text{-}TiCl_4$, for instance, a resonance absorption can be observed at room temperature. The reaction products $TiCl_4$ with $Al(C_2H_5)_3$ and $Al(C_2H_5)_3$, also show a tendency to paramagnetic resonance. The presence of a resonance absorption proves that radicals are formed. It is assumed that these radicals are connected with the process or the flow polymerization in a peculiar way.

Card 2/3

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Letters to the Editor

Electron Paramagnetic Resonance in the System $R_3Al-T_iCl_4$

62-58-3-29/30

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute for Chemical Physics, AS USSR)

SUBMITTED: January 9, 1958

Card 3/3

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

20-119-3-39/65

AUTHORS: Shilov, A. Ye., Sabirova, R. D., Gorshkov, V. I.

TITLE: On the Problem of the Formation of a Carbonium Ion in the Reactions of the Combination with Olefins (K voprosu ob obrazovanii iona karboniya v reaktsiyakh prisoyedineniya k olefinam)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 3, pp. 533 - 536 (USSR)

ABSTRACT: In the first section taking up one third of the work the authors report on previous papers, dealing with the same subject. This work investigates the absorption of ethylene in D_2SO_4 in the case of almost complete absence of an inverse decomposition of the methylsulfuric acid. For this purpose the reaction was performed at increased pressures (about 4 atmospheres) at room temperature. As reaction container served Π-shaped glass container; one of its knees contained the deutero-sulfuric acid, in the other one the ethylene was frozen out. After this the absorption of ethylene in the sulfuric

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On the Problem of the Formation of a Carbonium Ion in the Reactions of the Combination with Olefins

acid began, when the container was shaken mechanically. The ethylsulfuric acid, which had formed, was hydrated with water to ethyl alcohol for the determination of its D-content, which then was transformed into ethyl chloride by a reaction with HCL in presence of zinc chloride. The ethyl chloride, which was obtained in this way, then was analyzed by the mass spectrograph MC- 1A. A table illustrates the intensity distribution of the lines in the calibration spectrum of the common ethyl chloride and in the mass spectra of the analyzed reaction products. The compositions of the formed products, which were computed from the data of this table, are composed in a second table. The only deuterium derivative, which is in the mixture in a quantity worth mentioning, is the monodeuteroethyl chloride. The production of small quantities of $C_2H_3D_2Cl$ in 2 reactions, given here, obviously is connected with the inversability of the reaction

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On the Problem of the Formation of a Carbonium Ion in the Reactions of the Combination with Olefins

missing. By this obviously the hypothesis of the π-complex experimentally is proved. From the absence of an exchange follows that in these reactions not only the reversible isothermisation of the π-complex into a carbonium ion is missing, but also the isomerisation of the π-complex into an isomeric π-complex. The authors thank V. L. Tal'roze for his advices in the perfomance of the mass spectrometrical analyses. There are 2 tables and 11 references, 6 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, AS USSR)

PRESENTED: October 9, 1957, by N. N. Semenov, Member, Academy of Sciences, USSR
SUBMITTED: October 7, 1957
AVAILABLE: Library of Congress

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

5(4)

SOV/2o-122-4-25/57

AUTHORS: D'yachkovskiy, F. S., Rubnov, N. N., Shilov, A. Ye.

TITLE: The Investigation of the Recombination of Triphenylmethyl Radicals by the Method of Electron Paramagnetic Resonance (Issledovaniye kinetiki rekombinatsii trifenilmetil'nykh radikalov metodom elektronnogo paramagnitnogo rezonansa)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 4, pp 629-631 (USSR)

ABSTRACT: According to K. Ziegler et al. (Ref 1), the inverse reaction of the recombination of triphenylmethyl radicals must proceed with an activation energy which is equal to the difference between the activation energy of the dissociation and the dissociation heat of hexaphenylethane (6 - 8 kcal). By the method of paramagnetic electron resonance, this conclusion could be confirmed by immediate measuring of the dimerization rate of triphenylmethyl radicals in the solution. A capillary with a solution of hexaphenylethane in toluene was heated to 100° and then it was rapidly cooled down to the temperature of the experiment. This operation was carried out in a thermostat which was placed within the resonator of the EPR -spectro-

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

The Investigation of the Recombination of Triphenylmethyl Radicals by the Method of Electron Paramagnetic Resonance

meter. In this way, noticeable superequilibrium concentrations of the triphenylmethyl radicals were obtained, and their recombination rate could be measured. The carrying out of the experiments is discussed in short. A figure shows 2 kinetic curves of the recombination of triphenylmethyl radicals at -64° and -55°. The recombination rate increases noticeably with temperature. An equation for the kinetics of the radical recombination is given, the inverse reaction is taken into account. The second diagram demonstrates the temperature dependence of the equilibrium constant and the third diagram shows the temperature dependence of the constant of the dimerization rate. The Arrhenius (Arrenius) dependence is well satisfied. Thus, the direct determination of the dimerization rate of triphenylmethyl radicals confirmed not only the existence of an activation energy of this reaction but also its value (which coincides with the difference between the activation energy of the dissociation and the energy necessary for the breaking of the C-C bond of hexaphenylethane . The authors thank V. V. Voyevodskiy (Corresponding Member, Academy of Sciences, USSR) for his interest in this paper. There are 3

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SOV/2o-122-4-25/57

The Investigation of the Recombination of Triphenylmethyl Radicals by the Method of Electron Paramagnetic Resonance

figures and 3 references, 1 of which is Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics, Academy of Sciences, USSR)

PRESENTED: May 23, 1958, by V. N. Kondrat'yev, Academician

SUBMITTED: May 14, 1958

Card 3/3

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

5(4) SOV/20-123-5-28/50

AUTHORS: D'yachkovskiy, F. S., Bubnov, N. N., Shilov, A. Ye.

TITLE: Formation of Free Radicals in Bimolecular Reactions (Obrazovaniye svobodnykh radikalov v bimolekulyarnykh reaktsiyakh) The Reaction Between Triphenylchloromethane and Ethyl Lithium (Reaktsiya mezhdu trifenilkhlormetanom i etillitiyem)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 5, pp 870-873 (USSR)

ABSTRACT: The authors first mention some previous papers on this subject. They investigated the interaction of triphenylchloromethane with ethyl lithium, the first act of which must be exothermic if it proceeds according to the scheme. The reaction was carried out in a thin-walled test tube which was placed in the resonator of a EPR-spectrometer. In this reaction radicals were actually observed. The hyperfine spectrum of these radicals exactly corresponds to the spectrum of absorption of triphenylmethyl radicals. A diagram shows the kinetic curves for the variation of the concentration of triphenylmethyl radicals in the course of the reaction at -44, -54, and -80°. In the first instant of the reaction, the concentration has a distinctly marked maximum and it decreases behind this maximum. The descending parts of the curve represent the recombination of the

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Formation of Free Radicals in Bimolecular Reactions. The Reaction Between Triphenylchloromethane and Ethyl Lithium

triphenylmethyl radicals (formed in the first act of the reaction) before reaching the equilibrium concentration. The descending part of the curves represents the recombination of the triphenylmethyl radicals $(2(C_6H_5)_3C\cdot \rightleftharpoons (C_6H_5)_3C - C(C_6H_5)_3)$ in the first act of the reaction. The experimental results prove the primary formation of the above-mentioned radicals. The maximum of the kinetic curves is not caused by an increase in temperature of the reaction mixture. The character of the kinetic curves corresponds to an accumulation of the intermediate product in the successive bimolecular reactions. The constants of velocity and the activation energy of the reaction of radical formation can be calculated from the kinetic curves found in this paper. According to these results, elementary reactions of the type $R'X + YR'' \rightarrow R'\cdot + XY + \cdot R''$ under suitable energy conditions can proceed with the formation of free radicals of insignificant energy. It has hitherto not been possible to generalize the results of the present paper for any reaction of halogen

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SOV/20-123-5-28/50

Formation of Free Radicals in Bimolecular Reactions. The Reaction Between Triphenylchloromethane and Ethyl Lithium

alkyls with metalorganic compounds. There are 2 figures, 1 table, and 12 references, 5 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: July 16, 1958, by V. N. Kondrat'yev, Academician

SUBMITTED: July 12, 1958

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

5(4)

AUTHORS: Shilov, A. Ye., Sabirova, R. D. SOV/76-33-6-30/44

TITLE: Mechanism of the Primary Act of Thermal Decomposition of Chlorine Derivatives of Methane (Mekhanizm pervichnogo akta termicheskogo raspada khlorproizvodnykh metana).
I. Decomposition of Carbon Tetrachloride and Methyl Chloride
(I. Raspad chetyrekhkhloristogo ugleroda i khloristogo metila)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 6, pp 1365-1373 (USSR)

ABSTRACT: The thermal decomposition of methane chlorides has been insufficiently investigated; in fact, the decomposition of these compounds offers the possibility of clarifying the elementary act of the decay of molecules. In contrast to other decomposition mechanisms (radical and molecular mechanism), the above-mentioned type is termed "biradical mechanism" in the present paper. Thermodynamic calculations show that for CH_3Cl a direct splitting-off of the HCl would be more convenient than that of the Cl-atom; also for CCl_4, a scheme of decomposition has already been suggested (Ref 9); as, however, no precise experimental data are available on the mechanism mentioned in the title, corresponding tests were carried out in the present case. To prevent the course of secondary reactions,

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Mechanism of the Primary Act of Thermal Decomposition of Chlorine Derivatives of Methane. I. Decomposition of Carbon Tetrachloride and Methyl Chloride

SOV/76-33-6-30/44

the decomposition was investigated in the gas current for a small contact time. Toluene was used as carrier gas because the latter reacts with the atoms and radicals under formation of stable benzyl radicals. The working methods, as well as a scheme of the test arrangement (Fig 1), are given. Cl_2, C_2Cl_6 and C_2Cl_4 were determined as principal products of the thermal decomposition of CCl_4 with no carrier gas. The test results obtained at 618° show (Table 1) that the reaction kinetics is of first order and the reaction proceeds in a completely homogeneous way under the given test conditions (554 - 608°C). The experiments in the toluene current showed (Table 2) that the reaction-rate constant is similar to the one calculated from the tests without carrier gas. The experimental results clearly point to the reaction $CCl_4 \rightarrow CCl_3^{\bullet} + Cl^{\bullet}$, i.e. a radical decomposition as primary act of the CCl_4-decomposition, where C_2Cl_6 acts as intermediate product and CCl_4 primarily splits off the chlorine atom. The CH_3Cl-decomposition was investigated at

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Mechanism of the Primary Act of Thermal Decomposition of Chlorine Derivatives of Methane. I. Decomposition of Carbon Tetrachloride and Methyl Chloride SOV/76-33-6-30/44

843 and 874°C (toluene could not be used as carrier gas in this case), and it was ascertained that, besides HCl, mainly CH_4 and C_2H_2 (and a little H_2) are generated (Tables 3,4). $CH_3Cl \rightarrow CH_3^{\bullet} + Cl^{\bullet}$ (17) is assumed as primary reaction, whereupon rapid exothermal reactions (18)-(23) follow. The mechanisms of the secondary reactions of the CCl_4- and CH_3Cl-decomposition, as well as the corresponding activation energies, are indicated. There are 5 figures, 4 tables, and 18 references, 6 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moskva (Academy of Sciences of the USSR, Institute of Chemical Physics Moscow)

SUBMITTED: December 3, 1957

Card 3/3

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SOV/76-33-9-35/37

5(4)

AUTHORS: Shilov, A. Ye., Zefirova, A. K., Tikhomirova, N. N.

TITLE: Paramagnetic Electron Resonance in the System $Al(iso\text{-}C_4H_9)_3$ - $Ti(C_5H_5)_2Cl_2$

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 9, pp 2113 - 2114 (USSR)

ABSTRACT: A. Ye. Shilov and N. N. Bubnov (Ref 1) found paramagnetic electron resonance absorption (PERA) with a g-factor of about two in the precipitate formed by the reaction of aluminum trialkyls with titanium chlorides. The homogeneous system $Al(iso\text{-}C_4H_9)_3$ (I) - $Ti(C_5H_5)_2Cl_2$ (II) in toluene was investigated here at room temperature. At the applied concentration of (I) of 2.10^{-4} mol/l and ratios of (I):(II)=2:1, 10:1, 50:1 and 100:1, the authors found resonance absorption (Fig 1). The results lead to the assumption that the free electrons are located on the atoms of Al or Ti in the system under discussion. The number of basic lines of the hyperfine structure of the (PERA)-spectrum (Fig 2) indicates that the free electron reacts with the nucleus possessing a spin of 5/2, which would

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correspond to the Al atom. In this connection, the free electron interacts with two protons and a hyperfine structure of the spectrum is formed due to fission on the atoms of Al and H. In conclusion, the authors thank L. I. Zakharkin and V. V. Gavrilenko for supplying substance (I). There are 2 figures and 1 Soviet reference.

SUBMITTED: February 6, 1959

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

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S/076/60/034/04/27/042
B010/B009

AUTHORS: Shilov, A. Ye., Sabirova, R. D. (Moscow)

TITLE: Mechanism of the Primary Act of Thermal Decomposition of Chloromethanes. II. Decomposition of Chloroform

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 4, pp. 860 - 865

TEXT: The kinetics of thermal decomposition of $CHCl_3$ and $CDCl_3$ was investigated in a continuous flow vacuum apparatus (Ref. 1). The substance to be investigated was introduced in the same manner as in earlier (Ref. 1) experiments with CCl_4 and CH_3Cl; the quantitative determination of the decomposition products HCl and C_2Cl_6 was carried out in the same way. The DCl resulting from the decomposition of $CDCl_3$ was transformed into CH_3D with CH_3MgI, and determined mass spectrometrically. The $CHCl_3$ decomposition was investigated in a toluene current as well as without carrier gas, at 485-599°. Surprisingly, it was found that $CHCl_3$ de-

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composes much more readily than CCl_4. The experimental results (Table 1) show that decomposition takes place practically homogeneously and according to the first order (at gas pressures above 15 torr), and that toluene does not inhibit the reaction. An addition of CCl_4 does not accelerate the decomposition of $CHCl_3$ (Table 2). The experiments with $CDCl_3$ (Table 3, quantities of DCl obtained at 587-652°) show that $CDCl_3$ decomposes much more slowly than $CHCl_3$ (Table 4, comparison of measured values). Contrary to Sameluk and Bernstern's assumption (Ref. 2) the primary act of the decomposition reaction is shown to be the following biradical decomposition: $CHCl_3 \longrightarrow HCl + CCl_2$. There are 1 figure, 4 tables, and 7 references, 3 of which are Soviet.

SUBMITTED: July 9, 1958

Card 2/2

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

CHAYKIN, A.M.; SHILOV, A.Ye. (Moskva)

Methods of feeding reagents into a low pressure gas stream. Zhur. fiz.khim. 34 no.5:1140-1141 My '60. (MIRA 13:7)
(Chemical apparatus)

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S/020/60/132/05/30/069
B011/B126

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5.3100

AUTHORS: Zefirova, A. K., Tikhomirova, N. N., Shilov, A. Ye.

TITLE: The Structure of Some Products of the Interaction of Aluminum Alkyls With Derivatives of Titanium (IV)

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 5, pp. 1082 - 1085

TEXT: The authors have extended their previously (Ref. 1) observed rule governing the spectra of paramagnetic electron resonance (PER) of the products of the reaction of tri-isobutylaluminum with dicyclopentadienyl-titanium dichloride, to other compounds. Thus they have been able to draw some conclusions on the structure of the reaction products. They analyzed the interaction of aluminum alkyls and aluminum aryls: $Al(C_2H_5)_3$, $Al(C_6H_5)_3$, $Al(Iso\text{-}C_3H_7)_3$, $Al(CH_3)_3$, $Al(Iso\text{-}C_4H_9)_3$, $Al(C_2H_5)_2Cl$, with derivatives of aluminum alkyls and aluminum aryls: $(C_5H_5)_2TiBr_2$, $(C_5H_5)_2TiI_2$. With a reagent ratio of 1 : 1 in a toluenic

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The Structure of Some Products of the Interaction of Aluminum Alkyls With Derivatives of Titanium (IV)

solution, similar PER signals were received in all cases. Their g-factor was 1.975. With lower concentrations of the reagents (under $1 \cdot 10^{-3}$ M/l), the signals have a characteristic appearance (Fig. 1), which can be explained by the presence of an undefined super-fine structure. It can be seen from the PER spectra of other Al/Ti ratios that all Al-alkyls and Al-aryls can be divided into two groups. The signals (I) (Fig. 1) for $Al(CH_3)_3$, $Al(C_6H_5)_3$, and $AlCl(C_2H_5)_2$ are not noticeably changed by a rising Al/Ti ratio. On the other hand, new signals form with the remaining Al-alkyls and -aryls, which have a well defined super-fine structure. On a change in these systems from an Al : Ti ratio of 1 : 1 to $\sim$ 20 : 1, the signals I change into signals II (Fig. 2a). This latter is a doublet with a g factor of 1.985. If the ratio is increased further to $\sim$ 50 : 1, signal II is converted into signal III. Here g = 1.988 and there are eight components. In the Al-alkyls of the second group, the form of signals II and III is as independent of the nature of the alkyl as it is from the nature of the halogen atom in titanium halide. The conversion I → II → III led the authors to suppose that the Al-alkyls

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

The Structure of Some Products of the Interaction of Aluminum Alkyls With Derivatives of Titanium (IV)

contain similar admixtures, whose quantity equates that of the titanium derivative when the Al/Ti ratio is raised, and which forms new complexes therewith. Such admixtures can be hydrides which easily form in the first group of substances analyzed, but which are totally absent in the second group. The authors tested and confirmed this hypothesis. In this case the doublet II can be explained by splitting on the hydrogen atom of the complex, which contains one molecule of $AlH(Iso\text{-}C_4H_9)_2$. It can be seen from Fig. 3a that signal III consists of some six equally intensive lines and two lines which are three to four times less intense. Here, the super-fine structure has a natural explanation: the molecule of the reaction product contains two H atoms from two molecules of the Al-hydride. Figs. 2b and 3b show the PER spectra of the products of the reaction of $AlD[CH_2CD(CH_3)_2]_2$ with $(C_5H_5)_2TiCl_2$. From this it follows that, due to the substitution of D for H, the super-fine structure completely disappears in both cases. The authors draw conclusions on the structure of the complex produced, from their results and from data in

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the publications. They thank V. V. Voyevodskiy, Corresponding Member AS USSR for discussions, and O. P. Okhlobystin and V. V. Gavrilenko (Institut elementoorganicheskikh soyedineniy AN SSSR (Institute of Elemental-organic Compounds of the AS USSR)) for help in the syntheses. There are 3 figures and 4 references: 2 Soviet and 2 American.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences, USSR)

PRESENTED: February 1, 1960, by V.N. Kondrat'yev, Academician

SUBMITTED: January 29, 1960

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, A.Ye., kand.khim.nauk

"Chemical equilibrium and rate of reactions under high pressures" by M.G. Gonikberg. Reviewed by A.E. Shilov. Vest. AN SSSR 31 no.8:138-140 Ag '61. (MIRA 14:8)
(Chemical equilibruim)
(Gonikberg, M.G.)

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S/020/61/136/003/015/027
B016/B052

AUTHORS: Zefirova, A. K. and Shilov, A. Ye.

TITLE: Kinetics and Mechanism of the Interaction Between Aluminum Alkyls and Titanium Halides

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 3, pp. 599-602

TEXT: The authors report on the interaction mechanism and on the structure of particles taking part in the reduction process of the following compounds: $(C_5H_5)_2TiCl_2$ with 1) $Al(C_2H_5)_3$, 2) $Al(CH_3)_3$, and 3) $Al(C_2H_5)_2Cl$ (the examination of 3) was started together with E. W. Randall and L. E. Sutton in Oxford). Ad 1): in this fast reaction titanium is reduced under the formation of a light blue complex (4): $(C_5H_5)_2TiCl_2$ $Al(C_2H_5)_2$. Ethane forms in amounts which correspond to half of the $(C_5H_5)_2TiCl_2$ used, thus corresponding to a disproportionation of the ethyl groups. Ethylene

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Kinetics and Mechanism of the Interaction Between Aluminum Alkyls and Titanium Halides

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B016/B052

always forms in smaller amounts than ethane. Butane is not formed. Aluminum alkyls and $TiCl_4$ show a similar reaction although titanium here is reduced to valences lower than 3+. The lower yields of ethylene are generally explained by its partial polymerization. The authors found that the products of reaction 1) yield approximately 20% of butane by the decomposition by water. They explain this by the fact that ethylene enters the Me-C bond only once during the reduction. Ad 2): titanium is slowly reduced when toluene solutions of the reagents are mixed. The light blue complex (4) does not form. The red coloring rapidly turns light blue in the presence of ethylene. Thus, methane is liberated and ethylene is absorbed. The complex of the type (4) is sublimable and has the empirical formula of $(CH_3)_2AlCl\cdot(C_5H_5)_2TiCl$. Propylene, butylene-1, amylene-1, and other α-olefins react in a similar way, and approximately equimolar amounts of ethylene are absorbed. From the formation of propane and butane during the decomposition of the reaction products by water (in the presence of ethylene), the authors conclude that the reaction takes place in accordance with the scheme of disproportionation of the alkyl groups. Here, however, the olefin first enters the Me-C bond and forms a

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Kinetics and Mechanism of the Interaction Between Aluminum Alkyls and Titanium Halides

S/020/61/136/003/015/027
B016/B052

disproportionable alkyl radical. The olefins formed during the disproportionation also enter the Me-C bond. Ad 3): the reaction follows the known scheme of Refs. 1,3 at a measurable rate. From Fig. 1 the authors conclude that the reaction proceeds according to order 1/2 until a conversion of 70-80% is reached. Then it follows the first order. On the basis of their own results and the published data, the authors regard the free radical reaction mechanism of the above reduction of titanium halide as being refuted. However, they mention a number of data supporting the ion mechanism. The scheme enclosed illustrates the reaction mechanism suggested by the authors. There are 2 figures and 8 references: 2 Soviet, 4 US, 1 British, and 1 International.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: July 3, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: July 20, 1960

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

S/020/61/136/003/015/027
B016/B052

0) $[Al(C_2H_5)_2Cl]_2 \rightleftarrows Al(C_2H_5)_2^+ + Al(C_2H_5)_2Cl_2^-$
1) $2(C_6H_5)_2TiCl_2 + [Al(C_2H_5)_2Cl]_2 \rightleftarrows 2(C_6H_5)_2TiCl_2 \cdot Al(C_2H_5)_2Cl$ (II)
2) $II \rightleftarrows (C_2H_5)_2Ti(C_2H_5)Cl \cdot Al(C_2H_5)Cl_2$ (III)*
3) $III \rightleftarrows (C_6H_5)_2Ti\,C_2H_5^+ + Al(C_2H_5)Cl_3^-$
4) $(C_2H_5)TiC_2H_5^+ + Al(C_2H_5)_2Cl_2^- \rightarrow (C_2H_5)_2Ti(C_2H_5)_2 + Al(C_2H_5)_2Cl_2$
4') $(C_6H_5)_2Ti(C_2H_5)_2 + Al(C_2H_5)_2^+ \rightarrow (C_6H_5)_2Ti\overset{+}{C}_2H_5 + Al(C_2H_5)_2$
5) $(C_6H_5)_2Ti(C_2H_5)_2 \rightarrow (C_6H_5)_2Ti + C_2H_6 + C_2H_4$
6) $(C_2H_5)_2Ti + II \rightarrow (C_6H_5)_2TiCl + (C_2H_5)_2TiCl_2Al(C_2H_5)_2$

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

S/190/62/004/011/007/014
B106/B101

AUTHORS: Shilov, A. Ye., Shilova, A. K., Bobkov, B. N.

TITLE: Reaction of α-olefins with soluble complex Ziegler catalysts and the mechanism of polymerization initiation

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 11, 1962, 1688 - 1695

TEXT: In a previous paper (Ref. 3: A. K. Zefirova, A. Ye. Shilov, Dokl. AN SSSR, 136, 599, 1961) the hypothesis was put forward that the polymerization of ethylene is initiated by an ionic mechanism in the presence of a Ziegler catalyst obtained by bringing dicyclopentadienyl titanium into reaction with aluminum alkyls. This hypothesis was studied experimentally on the basis of the catalytic system $(C_5H_5)_2TiCl_2$-$Al(CH_3)_2Cl$. Since the polymerization of ethylene coincides with the reduction of Ti^{4+} to Ti^{3+}, which is accompanied by a change in color, the process was studied by spectrophotometry. Titanium is reduced by reaction of $(C_5H_5)_2TiCl_2$ with $Al(CH_3)_2Cl$ only in the presence of α-olefins (studied in

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ethyl groups can start without preliminary incorporation of the olefin. A rough estimate of the ion concentration in the reaction studied (using benzene as a solvent) with the aid of the Walden equation yielded $\sim 5 \cdot 10^{-9}$ mole/l for medium concentrations of complex A of $\sim 5 \cdot 10^{-3}$ mole/l. Hence, the concentration of ions is very low and their reactivity very high. There are 5 figures. The most important English-language references are: W. P. Long, D. S. Breslow, J. Amer. Chem. Soc., 82, 1953, 1960; A. N. Maki, E. W. Randall, J. Amer. Chem. Soc., 82, 4109, 1960; G. Wilkinson, J. M. Birmingham, J. Amer. Chem. Soc., 76, 4281, 1954.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AS USSR)

SUBMITTED: June 30, 1961

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

VEDENEYEV, V.I.; CHAYKIN, A.M.; SHILOV, A.Ye.

Branching in chain reactions involving molecular fluorine. Kin.i kat. 4 no.2:320-321 Mr-Ap '63. (MIRA 16:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Fluorine) (Hydrogen) (Fluorine organic compounds)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

YENIKOLOPYAN, N.S.; SHILOV, A.Ye.

"Chemical kinetics and catalysis" by G.M.Panchenkov, V.P.Lebedeva. Reviewed by N.S.Enikolopian, A.E.Shikov. Kin.i kat. 4 no.2:322-325 Mr-Ap '63. (MIRA 16:5)
(Chemical reaction, Rate of)(Catalysis)
(Panchenkov, G.M.) (Lebedev, V.P.)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

KAPRALOVA, G.A.; TROFIMOVA, Ye.M.; RUSIN, L.Yu.; CHAYKIN, A.M.; SHILOV, A.Ye.

Experimental evidence for branching in chain reactions involving molecular fluorine. Kin. i kat. 4 no.4:653-654 Jl-Ag '63. (MIRA 16:11)

1. Institut khimicheskoy fiziki AN SSSR.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

D'YACHKOVSKIY, F.S.; SHILOV, A.Ye.

Effect of the nature of halogen on the rate of reaction between ethyllithium and alkyl halides. Kin. i kat. 4 no.6: 919-923 N-D '63. (MIRA 17:1)

1. Institut khimicheskoy fiziki AN SSSR.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

D'YACHKOVSKIY, F.S.; SHILOV, A.Ye.

Reaction of the mechanism of ethyllithium with ethyl iodine.
Zhur.ob.khim. 33 no.2:406-411 F '63. (MIRA 16:2)

1. Institut khimicheskoy fiziki AN SSSR.
(Lithium) (Ethane)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

S/020/63/148/001/026/032
B101/B186

AUTHORS: Stepovik, L. P., Shilova, A. K., Shilov, A. Ye.

TITLE: Kinetics and mechanism of the initiation of ethylene polymerization on a soluble Ziegler-type complex catalyst

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 1, 1963, 122-125

TEXT: In a previous paper (Vysokomolek. soyed., 4, no.11 (1962)) the following reaction pattern was found for the polymerization of olefins on a $(\pi\text{-}C_5H_5)_2TiCl_2 + Al(CH_3)_2Cl$ catalyst:

$$(C_5H_5)_2TiCl_2 + Al(CH_3)_2Cl \rightarrow (C_5H_5)_2Ti(CH_3)Cl\cdot AlCH_3Cl_2 \text{ (complex A)};$$

$$A \rightleftharpoons (C_5H_5)_2TiCH_3^+ + Al(CH_3)Cl_3^- \; ; \; (C_5H_5)_2TiCH_3^+ + RCH{=}CH_2 \longrightarrow$$

$$\longrightarrow (C_5H_5)_2TiCH_2CH(R)CH_3^+ \; ; \; (C_5H_5)_2TiCH_2CH(R)CH_3^+ + AlCH_3Cl_3^- \longrightarrow$$

$$\longrightarrow (C_5H_5)_2TiCH_2CH(R)CH_3Cl\cdot Al(CH_3)Cl_2 \text{ (complex B)};$$

$$(C_5H_5)_2TiCH_2CH(R)CH_3Cl\cdot Al(CH_3)Cl_2 \rightarrow (C_5H_5)_2TiCl\cdot AlCH_3Cl_2 \text{ (complex C)}.$$

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Kinetics and mechanism of the ...

The reduced titanium in complex C is no longer active. In the present paper a direct proof of this order of reaction for ethylene is given, based on determining spectroscopically the variations in concentration of the complexes A, B (in the present case R = H) and C from the variations in optical density of the solution at 660 and 610 mμ for A and B, and at 720 and 520 mμ for C. The determination of the concentration of C on the basis of the e.p.r. spectrum agreed well with optical data. It was found that the sum A+B+C remained constant and that the reaction occurred in the order $A \longrightarrow B \longrightarrow C$. This is the first direct proof that the olefin molecule is added to the Ti-C bond. The kinetic equation for complex B is: $(d[B]/dt)_0 = k[A]^{1/2}[C_2H_4]$. The following data were found by experiments: $k_{22}{}^{o}{}_{C} \cdot 10^3$, $l^{1/2} \cdot mole^{-1/2} \cdot sec^{-1}$ equaled 4.9±0.2 for C_2H_4, 1.7±0.1 for C_3H_6, 0.51±0.04 for C_7H_{14}, and 0.037 for C_2H_3Cl. The specific effect which the catalyst investigated exerts on the ethylene polymerization is explained by the fact that in this case the linear C_3H_7 radical is formed from C_2H_4, whereas the branched group $-CH_2-CH(CH_3)R$ is formed from the

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α-olefins of the formula $RCH=CH_2$; this group is easily converted to the isoolefin $CH_2=C(CH_3)R$, with the titanium being reduced and termination occurring. This generally holds for Ziegler catalysts by which ethylene, but no other α-olefins, can be polymerized. An active B complex is formed only with C_2H_4. The ratio k_2/k_1 between the constant k_2 for chain propagation and k_1 for initiation was found to be 18.9, in good agreement with the value, 19, found from the ratio between maximum rate of polymerization at constant $p_{C_2H_4}$ and the initial rate of complex formation. These results do not confirm the assumptions made by J.S.W. Chien (J.Am. Chem.Soc., 81, 86 (1959)) and G.L.Karapinka, W.L.Carrick (J.Polym.Sci., 55, 145 (1961)). There are 3 figures and 1 table.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: July 23, 1962, by N.N. Semenov, Academician

SUBMITTED: July 23, 1962

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

L 12587-63 EPR/EWP(j)/EPF(c)/EWP(q)/EWT(m)/BDS AFFTC/ASD Ps-4/Pc-4/
Pr-4 RM/WW/JD
ACCESSION NR: AP3003225 S/0020/63/150/006/1282/1284

AUTHOR: Kapralova, G. A.; Rusin, L. Yu.; Chaykin, A. M.; Shilov, A. Ye.

TITLE: Elemental reactions of molecular fluorine

SOURCE: AN SSSR. Doklady, v. 150, no. 6, 1963, 1282-1284

TOPIC TAGS: molecular fluorine, fluorine, hydrogen, carbon, frozen olefin, ethylene, divinyl, hydrogen iodide, luminescence, flame diffusion, methane

ABSTRACT: The great reactive capacity of molecular fluorine, as compared to other halogens, is explained by its affinity for H, C, and metals, and the high energy of its bonding with C, H, and Me (over 100 kcal/mol) accounts for certain features of the reactions illustrated here, some of which involve the release of enormous amounts of energy and may lead to chain reactions. The authors give the results of their studies on the kinetics and mechanism of the 2 types of elemental reaction shown in equations (1) and (2) of the Enclosure. At liquid N sub 2 temperatures, type (2) reactions occur with the formation of free radicals by gaseous F sub 2 on interaction with frozen olefins. Measured with a thermocouple vacuum gage to determine the fall of F sub 2 pressure, the reaction was too fast for measurement when ethylene and divinyl were used. With chloro-substituted ethylene, the

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reaction rate decreased. In detailed kinetic studies on trichloroethylene bound to F sub 2, measurements of the surface size of the frozen olefin by the BET method showed that the quantity of F sub 2 molecules taken up by the olefin at -196C was almost identical to the number of olefin molecules at the surface; deeper layers reacted only when the temperature was increased. The energy of the reaction of C sub 2 HCl sub 3 was ca. 0.5 kcal/mol over the temperature range -196C to -163C; thus for olefins with a smaller number of Cl atoms in the molecule, especially ethylene, the energy of activation must be practically nil. Flame-diffusion measurements of the reaction rate of molecular F sub 2 with gaseous ethylene by Kistyakovskiy's method were made to study the reactions shown in equations (3), (4), (5), (6) of the Enclosure. Although the energy of activation was quite low, it was decidedly higher than in the surface reaction of F sub 2 with olefins. The reaction of F sub 2 with hydrogen iodide was accompanied by distinct luminescence, the spectrum corresponding to the known spectrum of excited FI* molecules. With an excess of HI, the stable reaction products were molecular iodine and hydrogen fluoride. Flame-diffusion determination of the velocity constants in experiments in which F sub 2 was added via a nozzle to a stream of HI was compared with initial flame-diffusion heating under different flow conditions. The good correspondence indicates that rate of luminescence and heat emission are functions of the same process. Flame-diffusion studies showed little reaction

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ACCESSION NR: AP3003225

between F sub 2 and CH sub 4 or HCl under comparable conditions and these reactions were practically thermo-neutral, in contrast to the markedly exothermic reactions of F sub 2 with olefins and HI. These findings further confirm the close relationship between activation energy and thermal effect, which is evidently analogous to Polyani's law for radical reactions. The paper was presented by Academician N. N. Semenov on 21 Feb 1963. Orig. art. has: 2 figures and 6 equations.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 00 DATE ACQ: 24Jul63 ENCL: 01

SUB CODE: CH NO REF SOV: 003 OTHER: 007

Card 3/3

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

ABAKUMOV, G.A.; SHILOV, A.Ye.; SHULYNDIN, S.V.

Electron paramagnetic resonance of the products of interaction between dicyclopentadienyl vanadium dichloride and aluminum alkyls. Kin. i kat. 5 no.2:228-234 Mr-Ap '64.
(MIRA 17:8)

1. Institut khimicheskoy fiziki AN SSSR.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

DZHABIYEV, T.S.; SABIROVA, R.D.; SHILOV, A.Ye.

Mechanism of interaction between triethylaluminum and tetrabutyl titanate, and the structure of complexes formed. Kin. i kat. 5 no.3:441-445 My-Je '64. (MIRA 17:11)

1. Institut khimicheskoy fiziki AN SSSR.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

[illegible], L.Yu.; CHAYKIN, A.M.; SHILOV, A.Ye.

Electron paramagnetic resonance spectra of halogen atoms in gas-phase branched chain reactions. Kin.i kat. 5 no.6:1121-1123 N-D '64. (MIRA 18:3)

1. Institut khimicheskoy fiziki AN SSSR.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SEMENOV, N.N.; SHILOV, A.Ye.

Part played by excited particles in branched chain reactions.
Kin. i kat. 6 no.1:3-16 Ja-F '65.
(MIRA 18:6)

1. Institut khimicheskoy fiziki AN SSSR.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

GRIGORYAN, E.A.; D'YACHKOVSKIY, F.S.; SHILOV, A.Ye.

Polymerization of deuteroethylene on the homogeneous catalytic system $(C_5H_5)_2TiCl_2 + Al(CH_3)_2Cl$. Vysokom.soed. 7 no.1:145-149 Ja '65. (MIRA 18:5)

1. Institut khimicheskoy fiziki AN SSSR.

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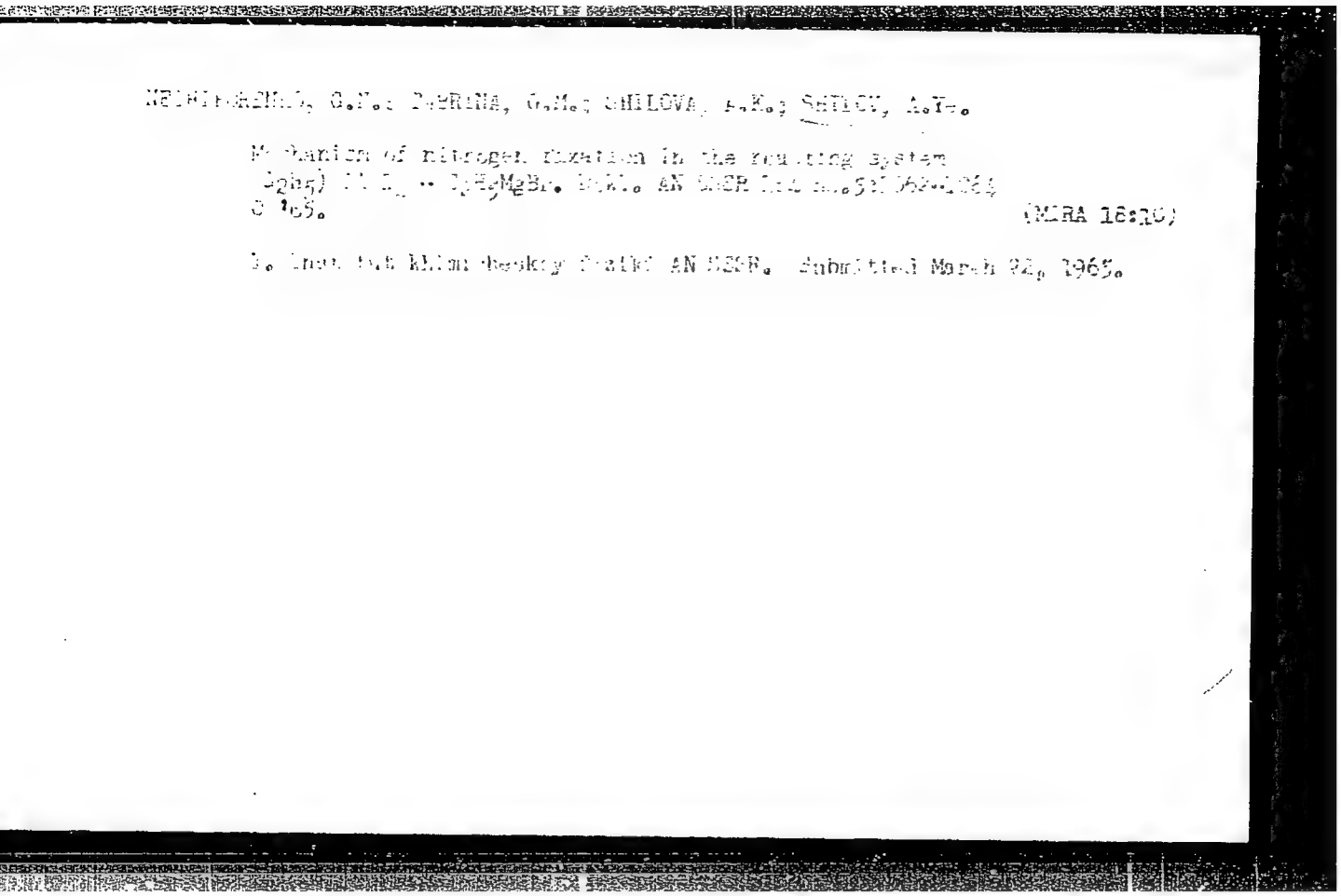

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

DZHABIYEV, T.S.; SHILOV, A.Ye.

Electron paramagentic resonance and structure of Ti (III) complexes formed during the reduction of cyclopentadiene compounds of Ti (IV) by alkyl derivatives of aluminum. Zhur. strukt. khim. 6 no.2:302-303 Mr-Ap '65. (MIRA 18:7)

1. Filial Instituta khimicheskoy fiziki AN SSSR, Noginsk.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

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L 11112-66 EPA/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/WW/JW/JWD/WE

ACC NR: AP6002164 SOURCE CODE: UR/0195/65/006/006/0977/0981

AUTHOR: Kapralova, G. A.; Trofimova, Ye. M.; Shilov, A. Ye.

ORG: Institute of Chemical Physics, AN SSSR (Institut khimicheskoy fiziki AN SSSR)

TITLE: The upper ignition limit in the reaction of fluorine with hydrogen

SOURCE: Kinetika i kataliz, v. 6, no. 6, 1965, 977-981

TOPIC TAGS: flame, combustion, propulsion, ignition limit

ABSTRACT: The reaction of hydrogen with fluorine is often explosive in character. It had been assumed that no branching took place in this reaction, but rather a thermal explosion. A mechanism can be proposed, however, which is different in principle from a thermal explosion:

0) $H_2 + F_2 \rightarrow F + HF + H$
1) $F + H_2 \rightarrow HF + H$
2) $H + F_2 \rightarrow HF^* + F$
3) $HF^* + F_2 \rightarrow HF + 2F$
4) $HF^* + M \rightarrow HF + M$
5) $H + O_2 + M \rightarrow HO_2 + M$
5') $F + O_2 + M \rightarrow FO_2 + M$
6) $F + \text{wall} \rightarrow \text{termination}$
6') $H + \text{wall} \rightarrow \text{termination}$

Card 1/2 UDC: 541.126.4:546.16+546.11

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

L 11112-66

ACC NR: AP6002164

The experimental results obtained in this work clearly indicate the existence of an upper pressure limit. Above the limit the reaction is slow, below the limit an explosion occurs. Branching of the chain reaction taking place above the limit is attributed to excited HF molecules. The reaction of an excited HF molecule with a fluorine molecule probably involves a chemical reaction of the type:

$$F-F+H^{*}-F\rightarrow F+HF+F$$

rather than simple energy transfer by collision, which is extremely improbable. The authors intend to investigate the reaction mechanism in more detail and to refine the value of k_3/k_4. Orig. art. has: 6 figures and 1 table.

[VS]

SUB CODE: 21/ SUBM DATE: 14Jul64/ ORIG REF: 003/ OTH REF: 004
ATD PRESS: 4176

Card 2/2

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, B.M.; KARMANOV, V.V.: BAGRAMOV, E.S.; YEVSEYEVA, A.M.; LUKOMSKIY, I.K.; ROTOVA, M.N.; BELOVA, L.G.; MARTYNOV, V.I.; obshchiy red.; SHILOV, P.D., red.; VENGERSKAYA, S.R., tekhn.red.

[Economy of Daghestan A.S.S.R.; statistical collection] Narodnoe khoziaistvo Dagestanskoi ASSR; statisticheskii sbornik. Makhachkala, Dagstatizdat, 1958. 119 p. (MIRA 12:12)

1. Daghestan A.S.S.R. Statisticheskoye upravleniye. 2. Statisticheskoye upravleniye Dagestanskoy ASSR (for B.M.Shilov, Karmanov, Bagramov, Yevseyeva, Lukomskiy, Rotova, Belova). 3. Nachal'nik Statisticheskogo upravleniya Dagestanskoy ASSR (for Martynov). (Daghestan--Statistics)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

MARTYNOV, V.I.; SHILOV, B.M.; KARMANOV, V.V.; YEVSEYEVA, A.M.; LUKOMSKIY, I.K.; MIKHAYLOVA, T.N.; CHEKMAREVA, M.M.; VENGERSKAYA, S., tekhn.red.

[Soviet Daghestan in 40 years; statistical collection] Sovetskii Dagestan za 40 let; statisticheskii sbornik. Makhachkala, Gosstatizdat, 1960. 157 p. (MIRA 13:8)

1. Daghestan A.S.S.R. Statisticheskoye upravleniye. 2. Nachal'nik Statisticheskogo Upravleniya Dagestanskoy ASSR (for Martynov).
(Daghestan--Statistics)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

L 43034-66 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6029794 SOURCE CODE: UR/0089/66/021/002/0083/0084

AUTHOR: Zvara, I.; Chuburkov, Yu. T.; Tsaletka, R.; Zvarova, T. S.; Shalayevskiy, M. R.; Shilov, B. V.

ORG: none

TITLE: Chemical properties of the element 104

SOURCE: Atomnaya energiya, v. 21, no. 2, 1966, 83-84

TOPIC TAGS: ~~element 104~~, transuranium element, chemical property, nuclear reaction, fission product, isotope separation

ABSTRACT: Chemical identification of the new element 104 has been attempted in a comparative study of the curium, californium, hafnium and new element chlorides. Previously, the 104^{260} isotope was identified by physical means only [G. N. Flerov et al. Atomnaya energiya, 17, 310, 1964]. The authors applied their own method, earlier developed, of a rapid, continuous separation of the elements of the III B and IV B groups of the Periodic Table to a mixture of gaseous chlorides of the elements produced by nuclear reactions. A PuO_2 target was bombarded with Ne^{22} ions in a Y-300 accelerator of the Joint Institute for Nuclear Research. Radioactive isotopes produced were chlorinated by a mixture of $NbCl_5$ and $ZrCl_4$ vapors in the 220—350C range in the chamber of the cyclotron. The curium, californium, and scandium isotope chlorides were adsorbed on the walls of the chamber and in the special filters, while

Card 1/2 UDC: 541.9:541.27

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L 43034-66

ACC NR: AP6029794

Zr., Hf and 104^{260} isotopes were transported in a stream of nitrogen to a fission event detector. The presence of the 104^{260} isotope was recorded by the detector in the gaseous stream transporting the IV B group element chlorides. A total of 12 atoms of the 104^{260} isotope was recorded during a series of experiments. Recurrence intervals of all 12 spontaneous fission events confirmed the earlier established half-life of the new element (0.3 ± 0.1 sec). Thus, confirmation was obtained of the earlier advanced hypothesis of a sharp difference in the chemical property between the 104 element and transuranium elements which were discovered in the past few years. The atomic number of the new element was determined and the element 104 was shown to be close to hafnium, hence to belong to the IV b group of the Periodic Table of the Elements. Thanks are expressed to G. N. Flerov, Corresponding Member of the Academy of Sciences SSSR. [JK]

SUB CODE: 07/ SUBM DATE: 18May66/ ORIG REF: 004/ OTH REF: 001 ATD Press 5065

Card 2/2

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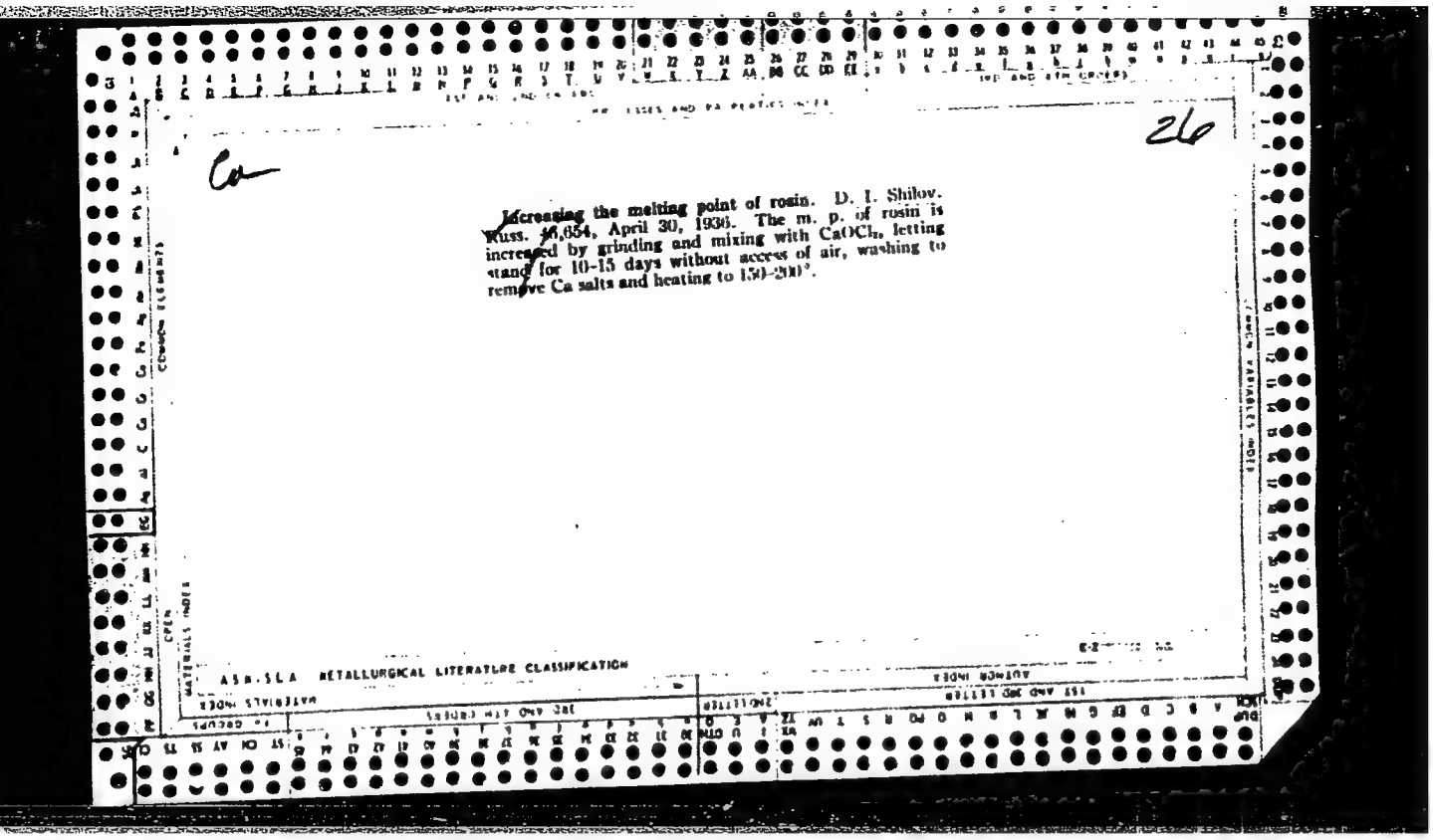

Increasing the melting point of rosin. D. I. Shilov. Russ. 36,654, April 30, 1936. The m. p. of rosin is increased by grinding and mixing with $CaOCl_2$, letting stand for 10-15 days without access of air, washing to remove Ca salts and heating to 150-200°.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, D.I.

Shilov, D.I. "Research on sinking 'sand' in argillaceous openings," Neft. khoz-vo, 1946, No. 11, p. 21-25

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

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B C S

991. THE SUSPENDING POWER OF THE CLAY DRILLING MUDS USED IN BORING-P.N. Khomikovski and D. I. Shilov (J. Appl. Chem. U.S.S.R. 19, 684,841, 1946). The influence of the clay concentration in a drilling mud on the maximum diameter of rock particle that the mud can maintain in a state of suspension was studied. The time effect was also examined. The data obtained are interpreted in the light of slow changes in the structural development of the muds.

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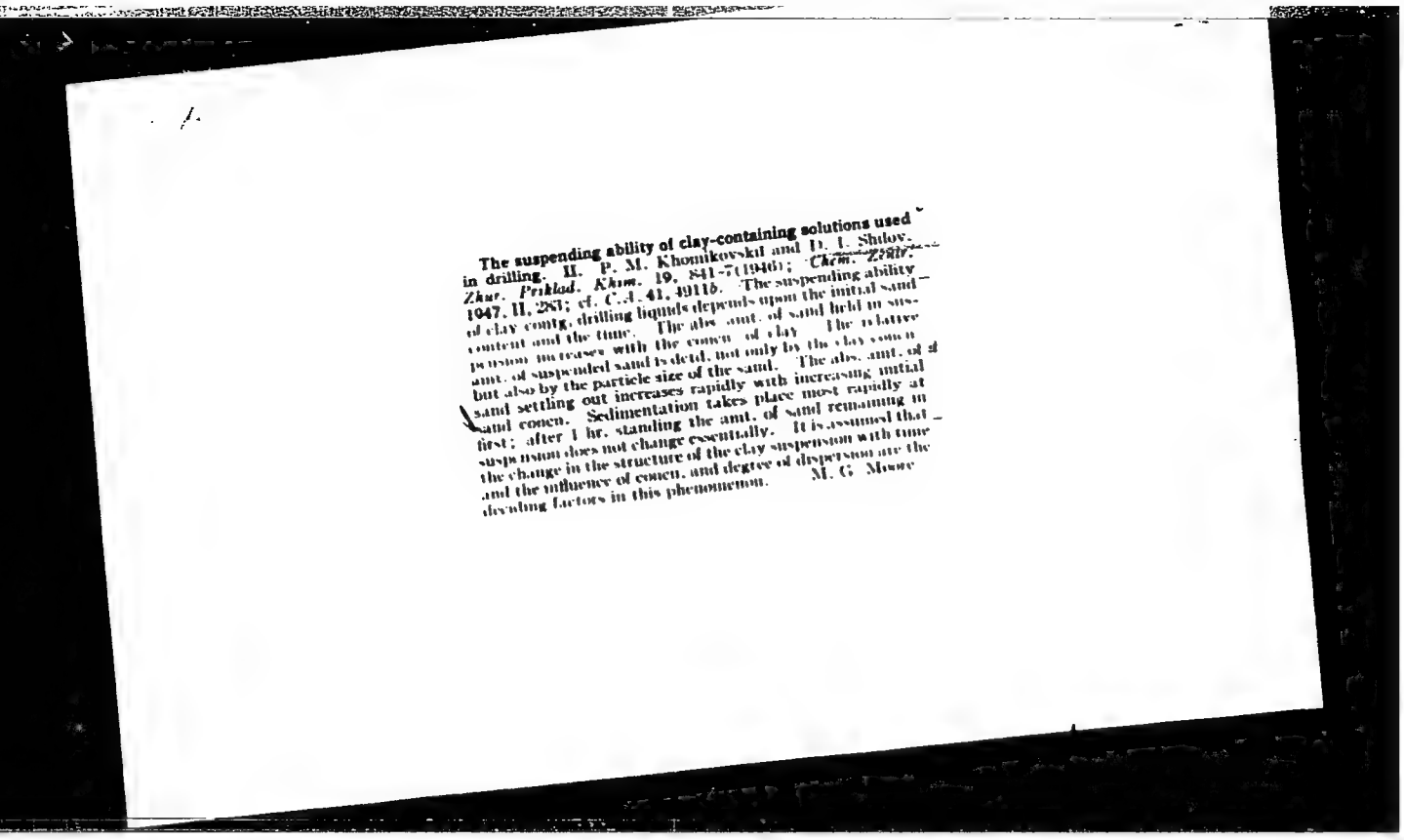

The suspending ability of clay-containing solutions used in drilling. II. P. M. Khomikovskii and D. I. Shilov. *Zhur. Prikład. Khim.* 19, 841-7(1946); *Chem. Zentr.* 1947, II, 283; cf. C.A. 41, 4911b. The suspending ability of clay contg. drilling liquids depends upon the initial sand content and the time. The abs. amt. of sand held in suspension increases with the concn. of clay. The relative amt. of suspended sand is detd. not only by the clay concn. but also by the particle size of the sand. The abs. amt. of sand settling out increases rapidly with increasing initial sand concn. Sedimentation takes place most rapidly at first; after 1 hr. standing the amt. of sand remaining in suspension does not change essentially. It is assumed that the change in the structure of the clay suspension with time and the influence of concn. and degree of dispersion are the deciding factors in this phenomenon. M. G. Moore

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, D. I. PA 18T12

USSR/Petroleum Industry Aug 1947
Lime

"Preparation of Lime Solution by Tsurinov's and Kvirikashvil's Methods," D. I. Shilov, 5 pp

"Neftyanoye Khozyaystvo" Vol XXV, No 8

This method was used at the Tuymazaneft' industry. Tables with results and observations. New method of preparing lime solutions by means of rollers and grinders has better quality solutions than old method. New method is more economical, as less lime has to be used. Also, is more efficient in lining the walls of the bore.

18T12

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

KHAR'KOV, V.P.; SHILOV, D.M. [deceased]

Modernizing the MSMU-150 butt-welding machine. Avtom. svar. 17 no.8:60-64 Ag '64. (MIRA 17:11)

1. Zlatoustskiy zavod metallokonstruktsiy (for Khar'kov).
2. Chelyabinskiy filial Gosudarstvennogo instituta po proyektirovaniyu, issledovaniyu i ispytaniyu stal'nykh konstruktsiy i mostov.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

ARZYMBETOV, S.; AMANZHOLOV, S., professor, redaktor; NURUSHEV, M., redaktor; SHILOV, F.G., redaktor; ZLOBIN, M.V., tekhnicheskiy redaktor

[Russian-Kazakh agricultural dictionary with the principal biological terms] Russko-kazakhskii sel'skokhoziaistvennyi slovar'; s osnovnymi terminami biologii. Izd. 2-oe, perer. i dop. Alma-Ata, Kazakhskoe gos. izd-vo, 1955. 270 p. (MLRA 9:8)
(Russian language--Dictionaries--Kazakh)
(Agriculture--Dictionaries)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SEMENYUK, Ivan; KULAKOV, N., redaktor; SHILOV, F., redaktor; OYSTRAKH, V., tekhnicheskiy redaktor

[My experience with gravity inclines] Moi opyt skorostnoi prakhodki bremsberga. Alma-Ata, Kazakhskoe gos. izd-vo, 1956. 8 p. (MLRA 9:10)

1. Brigadir prokhodchikov shakhty No. 37 kombinata "Karagandaugol'" (for Semenyuk)
(Mine haulage)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

KALIYEV, Botay; KULAKOV, N., redaktor; SHILOV, F., redaktor; OYSTRAKH, V., tekhnicheskikh redaktor

[Safety engineering under public control] Tekhniku bezopasnosti - pod obshchestvennyi kontrol'. Alma-Ata, Kazakhskoe gos. izd-vo, 1956. 11 p. (MIRA 9:10)

1. Obshchestvennyy inspektor po okhrane truda shakhty im. Kirova, kombinata "Karagandaugol'" (for Kaliyev)
(Coal mines and mining--Safety measures)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

PIL'NEN'KIY, Yevgeniy Ivanovich; SHILOV, F., red.; KOZLOV, S., tekhn. red.

[Metal pipe construction scaffolding] Stroitel'nye lesa iz metallicheskikh trub. Alma-Ata, Kazakhskoe gos. izd-vo, 1956. 12 p.
(Scaffolding) (MIRA 11:7)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

LYUBOSHCHINSKIY, Dmitriy Markovich; VAL'SHTEYN, G., redaktor; SHILOV, F., redaktor; OYSTRAKH, V., tekhnicheskiy redaktor

[Give coupled cutter-loaders a clear track ahead; the work practice of V.Borodin's rapair crew at the S.M.Kirov Mine] Sdvoennym kombainam - shirokuiu dorogu; iz opyta raboty remontno-podgotovitel'noi brigady shakhty im. S.M.Kirova V.Borodina. Alma-Ata, Kazakhskoe gos. izd-vo, 1956. 13 p. (MLRA 9:10)
(Coal mines and mining)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

NUDEL'MAN, Sergey Borisovich; SHILOV, F.G., redaktor; BARAG, T.Ya., redaktor; CHEZHIK, F., tekhnicheskiy redaktor

[Large brick block apartment houses] Zhilye doma iz krupnykh kirpichnykh blokov. Alma-Ata, Kazakhskoe gos.izd-vo, 1956. 20 p. (Apartment houses) (Building blocks) (MLRA 10:7)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

PIL'NEN'KIY, Yevgeniy Ivanovich; SHILOV, F.G., redaktor; KOZLOV, S.V., tekhnicheskiy redaktor

[Building with reinforced concrete openwork girders and pressed reed slabs] Stroitel'stvo iz azhurnogo zhelezobetona i kamyshitovykh plit. Alma-Ata, Kazakhskoe gos. izd-vo, 1956. 25 p. (MLRA 9:10)
(Building)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

KURDYAYEV, Boris Sergeyevich; SHILOV, F.G., redaktor; BARAG, T.Ya., redaktor; KOZLOV, S.V., tekhnicheskiy redaktor

[Engineer G.A.Maniukov's system of bricklaying] Kirpichnaia kladka sistemy inzhenera G.A.Maniukova. Alma-Ata, Kazakhskoe gos. izd-vo, 1956. 26 p. (MLRA 9:10)
(Building blocks) (Bricklaying)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, F.G., redaktor; KIRPICHNIKOV, V.A., redaktor; ZLOBIN, M.V., tekhnicheskiy redaktor

[Karaganda's coal is for the motherland; a collection of articles by coal miners of the Karaganda Basin] Ugol' Karagandy - rodine; sbornik statei ugol'shchikov i shakhtostroitelei Karagandinskogo ugol'nogo basseina. Alma-Ata, Kazakhskoe gos. izd-vo 1956. 56 p. (MLRA 9:10)

(Karaganda Basin--Coal mines and mining)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

BRAND, Vladimir Eduardovich; BATURINSKIY, Yevgeniy Petrovich; KULIKOVSKAYA, Nadezhda Borisovna; SHILOV, F.G., redaktor; OYSTRAKH, V.G., tekhnicheskiy redaktor

[The use of reeds in industrial house construction] Primenenie kamysha v zavodskom domostroenii. Alma-Ata, Kazakhskoe gos. izd-vo, 1956. 108 p. (MIRA 9:12)
(Building materials)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

ZVEREV, N.V., redaktor; SHILOV, F.G., redaktor; NAGIBIN, P.A., tekhnicheskiy redaktor

[New construction in Kazakhstan during the sixth five-year plan] Novostroiki shestoi piatiletki Kazakhstana. Alma-Ata, Kazakhskoe gos.izd-vo, 1957. 134 p. (MLRA 10:9)
(Kazakhstan--Industries) (Kazakhstan--Building)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

PAL'GOV, Nikolay Nikitich; SHILOV, F.G., red.; ZLOBIN, M.V., tekhn. red.

[Altering Kazakhstan's nature; popular science sketch] Preobrazovanie prirody Kazakhstana; nauchno-populiarnyi ocherk. Alma-Ata, Kazakhskoe gos.izd-vo, 1955. 39 p. (MIRA 16:8)

1. Deystvitel'nyy chlen AN Kaz.SSR (for Pal'gov).
(Kazakhstan--Economic geography)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

- LIVANOV, Mikhail Mikhaylovich; BELIKOV, Ye.F., dotsent, retsenzent; SHILOV, F.Ye., inzhener-geodezist, retsenzent; LETOVAL'TSEV, I.G., dotsent, red.; VASIL'YEVA, V.I., red.izd-va; ROMANOVA, V.V., tekhn.red.;

[Surveying in construction] Geodeziia v stroitel'stve. Moskva, Gosgeoltekhizdat, 1963. 312 p. (MIRA 16:6)
(Surveying)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G.I.

Rings of functions on an n-dimensional torus. Nauk.zap.Kiev.un.11 no.7:17-23 '52. (Functions) (MLRA 9:10)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G.I., assistent

The TPO-1 instrument for checking the thickness of nonmagnetic coatings and the investigation of the performance of some elements of this device. Izv.vys.ucheb.zav.; prib. no.4:46-56 '59. (MIRA 13:5)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy tekhnologii priborostroyeniya.
(Thickness measurement)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, German Ivanovich; VALITOV, Abdrashid Mukhamed-Zakirovich; GUTKIN, V.G., red.

[New devices for the control of the thickness of metallic and nonmetallic coatings] Novye pribory dlia kontrolia tolshchiny metallicheskikh i nemetallicheskikh pokrytii. Leningrad, 1964. 30 p. (MIRA 17:11)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

VALITOV, A. M-Z.; SHILOV, G.I.

The TPO-V device for precision checks of coating thickness. Izm.tekh. no.6:14-17 Je '64. (MIRA 17:12)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

KLIMENKO, N.N. (Vladivostok); SHILOV, G.K. (Vladivostok)

Building multiple-story houses on weak soils. Osn., fund. i mekh. grun. 3 no.4:18-21 '61. (MIRA 14:8)
(Vladivostok--Foundations)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. M.

At the Dnepropetrovsk Mining Institute in Artem Sergeyev from April 1939 to April 1947, the following dissertations were defended in connection with attaining the scholarly degree of Candidate of Technical Sciences (specializing in mining electrical engineering: G. M. Shilov on 27 March 1941 defended his dissertation on the subject "Traveling electrooptical signaling in electric-locomotive hauling in the iron mines of the Krivoy Rog Basin".

The official opponents of this dissertation were Candidate of Technical Sciences A. I. Selishchev and Candidate of Technical Sciences Docent S. A. Volotkovskiy.

An analysis was made of the elementary relay-contact systems of signaling in electric-locomotive hauling. A model was constructed and a typical system of electric signaling was worked out for the Krivoy Rog iron mines. A theoretical and experimental investigation of setting relays was presented.

SO: Elektrichestvo [Electricity], No. 10, October 1947. Moscow.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

STEPANOVA, Z.S., kand.khim.nauk; SHILOV, G.M., inzh.

Efficient system of lubricating spindles. Tekst. prom. 18 no.6: 51-52 Je '58. (MIRA 11:7)
(Textile machinery) (Lubrication and lubricants)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

"Ideals and Subrings of the Ring of Continuous Functions," Dokl. AN SSSR, 22, No.1, 1939

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

"On the Theory of the Unreals in the Norm Rings of Functions," Dokl. AN SSSR, 27, No.9, 1940

Inst. Math., Moscow State U.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

O rasshirenii maksimal'nykh idealov. DAN, 29, (1940), 83-85.

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A.G.,
Markushevich, A.I.,
Rashevskiy, P.K.
Moscow-Leningrad, 1948

Translation - "On the Extension of Maximal Ideas"

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

"On the Fourier Coefficient of a Class of Continuous Functions," Dokl. AN SSSR, 35, No.1, 1942

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye., GEL'FAND, I. M. and RAYKOV, D. A.

"Commutative Normed Rings," Uspekhi mat. nauk, 1, No.2, 1946

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

Primer kontinualinoy sistemy primarny kh idealov v kol'tse funktsiy. M., Uchen. zap. un-ta, (1947).

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A.G.,
Markushevich, A.I.
Rashevskiy, P.K.
Moscow-Leningrad, 1948

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

"Works of Mathematical Institute imeni V. A. Steklov," Uspekhi Mat. Nauk, 2, No.6, 1947

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. PA 20T18

USSR/Mathematics - Group Theory Jun/Aug 1947
Mathematics - Functions, Complex Variable

"On Normed Rings Possessing One Generator," G. Shilov, Moscow, 23 pp

"Matematicheskiy Sbornik" Vol XXI

A detailed discussion of the complex functions f(z) in the homeomorphic rings of I. Gelfand.

20T18

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

USSR/Mathematics - Group Theory 1947
Mathematics - Function Theory

"On Regular Normed Rings," G. Shilov, 118 pp

"Trudy Matematicheskogo Instituta imeni V. A. Steklova" Vol XXI

An investigation of the "normierte Ringe" of I. Gelfand as they pertain to various infinite series, Fourier's series, complex functions, and convergence and divergence in integrals.

22T51

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye

2000

Šilov, G. E. On a property of rings of functions. Doklady Akad. Nauk SSSR (N.S.) 58, 985–988 (1947). (Russian)

[illegible] normed ring consisting of functions [illegible] hereinafter a, b [illegible], without any loss of generality to the case $a=0$, $b=2\pi$), D_n the class of all infinitely differentiable functions on that interval and C_n the class of all functions with n continuous derivatives there. The following theorem is proved: if R contains D_n, then it contains C_P for some P. Previously published results [Gel'fand, Raĭkov, and Šilov, paper reviewed above; Šilov, Trav. Inst. Math. Stekloff 21 (1947); these Rev. 9, 596] permit comparison of R with normed rings built by introducing in D_n norms defined by the expressions

$$\max_{a\le t\le b} \sum_{k=0}^{n} |x^{(k)}(t)|\alpha_k^{-1},$$

where $0\le\alpha_{n+1}\le\alpha_n a_n$ and $\lim \alpha_n^{1/n}=0$, leading to the following basic result: if the function x in D_n has the Fourier coefficients a_n, where $2\pi a_n=\int_0^{2\pi}x(t)e^{int}dt$, then the relation $\lim_{n\to\pm\infty}\|a_n e^{int}\|=0$ holds in R. It then follows by a reductio ad absurdum that $\|e^{int}\|\le C(|n|^N+1)$ for some N, and hence that the required P exists. *M. H. Stone.*

Source: Mathematical Reviews, Vol 10 No. 4

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G.E.

2

Silov, G. E. Rings of type (... Doklady Akad. Nauk SSSR (N.S.) 66, ... (Russian)

Silov, G. E. Rings of type (on the line and on the circumference. Doklady Akad. Nauk SSSR (N.S.) 66, 1063–1066 (1949). (Russian)

Let R be a commutative normed ring with identity and $\mathfrak{M}$ its space of maximal ideals topologized in the usual way and let $x \to x(M)$ be the homomorphism of R onto the complex numbers associated with $M \in \mathfrak{M}$ [Gelfand, Rec. Math. [Mat. Sbornik] N.S. 9, 51–24 (1941), these Rev. 3, 51]. The ring R is said to be ... provided, for closed ... M and $M \in F$, there ... such that $x(M) = 0$ for ... $x(M) = 1$, where ... and ... $x \in R$, define ... that $\gamma(M)$ coincides with ... some neighborhood of $M \in \mathfrak{M}$. If $\sup \|x\|_M$ gives a norm equivalent to $\|x\|$, then R is said to be of ... type. (See Silov, Trav. Inst. Math. Steklov 21, 1–118 (1947), these Rev. 9, 506.) A ring (or ideal) is called "primary" if it contains (or is contained in) exactly one maximal ideal M in a semi-simple regular ring R contains a minimal closed primary ideal [Silov, ibid., p. 41] (denoted by $J(M)$).

Consider a family (finite) of circles C_α defined by $|\lambda_\alpha| = h_\alpha$ in the complex plane and form the bicompact product space $S = \prod_\alpha C_\alpha$. Let F be a closed subset of S and associate with each ... primary ring K_t. The set $\sum_t \oplus K_t$ of all functions $x(t) \in K_t$, defined on F, with $x(t) \in K_t$, and $\|x(\cdot)\| = \sup_t \|x(t)\|_{K_t}$ as a normed ring under the natural algebraic operations and $\|x(\cdot)\|$ as norm. Now, for $t = (\lambda_\alpha) \in F$ associate with each α a particular element $z_\alpha(t) = x_{\lambda_\alpha} + J_{\lambda_\alpha}$ of $\sum_t \oplus K_t$, where x_{λ_α} is in the maximal ideal of K_t. The closed subring of $\sum_t \oplus K_t$ generated by the z_α is called a "continuous direct sum of the first kind" and is denoted by $\sum_t \oplus K_t$. The closed subring of $\sum_t \oplus K_t$ generated by the exponentials $e^{i\lambda_\alpha}$ is called a "continuous direct sum of the second kind" and is denoted by $\sum'' \oplus K_t$.

Source: Mathematical Reviews, Vol 11 No. 1

Silov, G. E. Card 1/2

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Let R be an arbitrary ring of type C and denote by $|z_\alpha|$ a system of generators for R. Define C_α to be the set of l_α with $|l_\alpha| \leqq \max_M |z_\alpha(M)|$. Then the space $\mathfrak{M}$ of maximal ideals of R can be considered embedded in $S = \prod_\alpha C_\alpha$. For $l \in \mathfrak{M} \subset S$, set $K_l = R/J(l)$. Then $R = \sum'_{\mathfrak{M}} R/J(l)$. Conversely, if $R = \sum'_S K_l$ is a regular semi-simple ring, then R is of type C. Let $B = \prod_\alpha I_\alpha$, where I_α is the closed interval $[0, 2\pi]$ with 0 and 2π identified, and let R be a ring of type C of functions defined on B with the functions $z_\alpha(t) = e^{it_\alpha}$ ($t = |t_\alpha| \in B$) as generators. Then $R = \sum''_B R/J(t)$. Conversely, if $R = \sum''_B K_t$ is a regular semi-simple ring, then R is of type C. Criteria are also given in the above two situations for regularity and semi-simplicity of the direct sums involved.

The second paper is concerned with applications of the above results in the following special cases. (1) The ring R is a "homogeneous ring on a circumference." That is, R is a ring of functions $x(t)$ defined on the closed interval $[0, 2\pi]$, with 0 and 2π identified, generated by e^{it} and such that $x(t+h) \in R$, $\|x(t+h)\| = \|x(t)\|$ for arbitrary real h. In this case all of the primary rings $R/J(t)$ are isomorphic. (2) The ring R is a ring of type C consisting of functions defined on the closed interval $[a, b]$, possessing one generator and containing all infinitely differentiable functions. Here the primary rings $R/J(t)$ are uniformly finite dimensional. (3) The ring R is a ring of type C on $[a, b]$ with one generator and containing all functions with continuous derivatives. A number of other concrete examples are also discussed.

C. E. Rickart (New Haven, Conn.).

: Mathematical Reviews, Vol 11 No. 1

Silov, G.E. Card 2/2

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

16

Silov, G. E. On a boundary property of analytic functions. Moskov. Gos. Univ. Uč. Zap. 145, Mat. 3 (1949), 126–128. (Russian)

Let $u(z)$ be an analytic function in $|z|<1$ which is continuous in $|z|\leq 1$, vanishes at the single point $z=1$, and has zero logarithmic residue at that point. Then, it was shown by T. Carleman [Les fonctions quasi-analytiques, Gauthier-Villars, Paris, 1926; Note III, 107–109] that, in the terminology of the theory of rings, in the ring A of all functions, analytic in $|z|<1$, continuous in $|z|\leq 1$, the principal ideal generated by $u(z)$ contains any function $v(z)\in A$ which vanishes at $z=1$. The author considers the analogous question if $u(z)$ has a non-vanishing logarithmic residue and proves the following theorem: The functions

$$u_\alpha(z)=(z-1)\exp\left(\frac{\alpha}{z-1}\right)\ (0\leq\alpha<\infty)$$

belong to the ring A and vanish at the single point $z=1$. They generate distinct closed ideals in the ring A. Every function $u(z)\in A$ which vanishes at the single point $z=1$ generates an ideal which coincides with one of the above ideals.

W. Seidel (Notre Dame, Ind.).

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

Doc Physicomath Sci

SHILOV, G. YE.

Dissertation: "Rings of the C Type."
28/6/50

Moscow Order of Lenin State U imeni
M. V. Lomonosov

SO Vecheryaya Moskva
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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G-4e

Šilov, G. E. An attempt to present the theory of determinants without the theory of substitutions. Uspehi Matem. Nauk (N.S.) 5, no. 5(39), 177–179 (1950). (Russian)

Source: Mathematical Reviews, Vol 12 No. 5

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. E.

Shilov, G. E. Singular points of algebraic curves in the plane. Uspehi Matem. Nauk (N.S.) 5, no. 5(39), 183–192 (1950). (Russian)

In dieser Arbeit werden die Gedankengänge, die sich mit dem Newtonschen Polygon und der bekannten Puiseuxschen Reihenentwicklung algebraischer Funktionen beschäftigen, wieder lebendig gemacht. Dabei setzt der Verfasser einerseits die betrachtete Kurve etwas allgemeiner als algebraisch voraus, nämlich in der Gestalt $f=\sum a_{ij}x^iy^j=0$, wobei nur die k_i als ganz, die l_j nur als reell vorausgesetzt werden, andererseits interessiert er sich nur für reelle Zweige dieser Kurve. Bei der Herleitung der Reihenentwicklungen in einem Punkt wird das Puiseuxverfahren in folgender Weise gewissermassen dualisiert: Statt dem einzelnen Gliede in $f=0$ den Punkt (k_i, l_j) den Diagramms zuzuordnen, wird ihm die Gerade $n=k_i+rl_j$ (s und r kartesische Koordinaten) zugeordnet. Aus Stücken dieser Geraden setzt man dann einen geschlossenen Streckenzug zusammen, dessen Eckpunkte zur Bestimmung des ersten Exponenten r der Reihenentwicklung $y=Ax^r(1+y_1)$ dienen. Zur Bestimmung von A ergibt sich dann wie bei Puiseux eine algebraische Gleichung, auf deren reelle Wurzeln es hier aber nur an kommt. Zur Berechnung der weiteren Exponenten und Koeffizienten ist das Verfahren dann wie üblich, zu iterieren. Erläutert wird alles an den Kurven $x^4+x^2y-y^4\ xy=0$, $xy^6+y^6-2y^4+y^4+xy^6-2x^2y^2+x^3y-x^4=0$. W. Burau.

Source: Mathematical Reviews, Vol 12 No. 9.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

Šilov, G. E. Description of a class of normed rings of functions. Mat. Sbornik N.S. 26(68), 291–310 (1950). (Russian)

A ring R of continuous functions on an interval $a \leq t \leq b$ is said to possess one generator provided R is equal to the completion of the ring of polynomials $P(t)$ with respect to the norm $\|P(t)\|$ given in R. The ring R is said to be of type C provided its norm is equivalent to the norm $\|x(t)\|' = \sup_{a \leq t \leq b} \|x(t)\|$, where $\|x(t)\| = \inf \|y(t)\|$, the infimum being taken over all $y(t)$ in R each of which coincides with $x(t)$ in some neighborhood of the point s. The ring C of all continuous functions $x(t)$ on $a \leq t \leq b$ under the norm $\|x(t)\| = \max_{a \leq t \leq b} |x(t)|$ is a ring of type C with one generator as is also the ring D_1 of all continuous functions $x(t)$ on $a \leq t \leq b$ which possess a continuous derivative $x'(t)$ under the norm $\|x(t)\| = \max_{a \leq t \leq b} \{|x(t)| + |x'(t)|\}$. In the present paper a characterization is obtained for all rings of type C with one generator which lie between D_1 and C. It turns out that such rings are obtained by completing the ring of polynomials $P(t)$ under a norm

$$\|P(t)\| = \sup_{a \leq t \leq b} \{|P(t)| + \alpha(t)|P'(t)|\},$$

where $\alpha(t)$ is a function, called the characteristic function of the ring, which is nonnegative, upper semi-continuous and satisfies a certain admissibility condition too complicated to be stated here. Conversely, every such characteristic function gives rise to a ring R_α of the desired kind. An intrinsic characterization of functions in R_α is obtained in terms of a notion of differentiation, with respect to $\alpha(t)$ defined as follows. Denote by $\mathfrak{F}_\alpha$ the set of all f such that $\alpha(t) \geq 1/n$. Then a function $f_\alpha'(t)$ is said to be a "generalized derivative of $f(t)$ with respect to $\alpha(t)$" provided $f_\alpha'(t)$ is continuous on each of the sets $\mathfrak{F}_n$, $f(t)$ is absolutely continuous on each interval Δ where $1/\alpha(t)$ is summable and $f_\alpha'(t) = f'(t)$ almost everywhere on Δ. This generalized derivative has the same elementary properties as the ordinary derivative and coincides with it when $\alpha(t) \equiv 1$. A necessary and sufficient condition for a continuous function $f(t)$ to belong to R_α is that the generalized derivative $f_\alpha'(t)$ exist and $\max_n |f_\alpha'(t)| = \sigma(n)$.

C. E. Rickart (New Haven, Conn.).

Source: Mathematical Reviews, 1950 Vol 11 No. 8

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SILOV, G. E.

Šilov, G. E. On rings of functions with uniform convergence. Ukrain. Mat. Žurnal **3**, 404–411 (1951). (Russian)

The author first establishes a simple generalization of the complex form of the Stone-Weierstrass theorem [M. H. Stone, Math. Mag. 21, 167–184, 237–254 (1948); these Rev. 10, 255], as follows. Let $C(G)$ be the (complex) Banach algebra of all continuous complex-valued functions on the compact Hausdorff space G, with the usual algebraic operations and norm. Let L be a closed subalgebra of $C(G)$ containing all constants. Let Λ be a closed subalgebra of L such that $x \in \Lambda$ implies $\bar{x} \in \Lambda$. The equivalence relation $\sim$ on G such that $t_1 \sim t_2$ if and only if $f(t_1)=f(t_2)$ for all $f \in \Lambda$ obviously dissects G into disjoint closed sets τ. For every such τ, let $J(\tau)$ be the ideal in L of all functions in L which vanish on τ. There is an obvious and natural isomorphism carrying the difference algebra $L-J(\tau)$ onto an algebra of functions defined on τ. The generalized Stone-Weierstrass theorem asserts that if $f \in C(G)$ and if f agrees on every τ with a function in $L-J(\tau)$, then $f \in L$. For $L=\Lambda=C(G)$, this is exactly the Stone-Weierstrass theorem. The theorem is applied to prove the following result. Let C be the algebra $C(|z| \leqq 1)$ and A the closed subalgebra of C consisting of the functions which are analytic on $|z|<1$. Let $\{A, \Sigma\}$ be the smallest closed subalgebra of C containing A and the real functions $f \in \Sigma$. A closed subset S of $|z| \leqq 1$ is said to be admissible if S has void interior and if for all z_0 non-$\in S$, $|z_0|<1$, there is a continuous curve running from z_0 to $|z|=1$ which does not intersect S. Then it is proved that $\{A, \Sigma\}=C$ if and only if all sets of points equivalent under the set of functions Σ are admissible. This generalizes a theorem attributed to Hurgin [Moskov. Gos. Univ. Učenye Zapiski **145**, Ser. Mat. **3** (1949) (unavailable)].

E. Hewitt (Seattle, Wash.).

SO: MATH. REV; VOL. 14, NO. 9, OCT. 1953 PP. 831-934 - UNCLASSIFIED

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

USSR/Mathematics - Functions Jan/Feb 51

"Homogeneous Rings of Functions," G. Ye Shilov

"Uspekhi Matemat Nauk" Vol VI, No 1 (41), pp 91-137

Describes one important class of normed rings of functions: rings of functions given in bicompact group and invariant relative to displacements with respect to this group. Main results of this study are constr of continuous direct sum of primary rings in bicompact commutative group and proof of possibility of obtaining by this means any homogeneous

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USSR/Mathematics - Functions (Contd) Jan/Feb 51

ring of functions of type C. Discusses homogeneous spaces of functions; Fourier series relative to continuous characters; regular normed rings; continuous sums of primary rings; homogeneous rings of functions; certain applications and examples. 32 ref.

LC 177T53

SHILOV, G. Ye

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001549420018-7

SHILOV, G. Ye.

USSR/Mathematics - Vectors Sep/Oct 51

"Vector Smooth Functions," G. Ye. Shilov

"Uspekh Matemat Nauk" Vol VI, No 5 (45), pp 176-184

Considers continuous complex-valued functions $w(x,y) = u(x,y)+iv(x,y)$ defined in a certain region G of the plane of real variables x and y. Each such function w can be interpreted as a vector field $\overline{w} = (u,v)$ defined in G. And conversely, each vector field $\overline{w} = (u(x,y), v(x,y))$ defined in G can be written in the form of a complex function $w = u+iv$. Notes certain properties of divergence and curl functions.

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